Appendix A: Data and Variables

Data and Variables

The needs assessment will rely on five primary measures to assess supply and demand for education. Supply will be addressed using a series of measures termed "workforce supply" which will approximate the annual number of graduates entering the workforce by degree level and major field of study. "Education supply" consists of a series of measures to describe the current and planned capacity of the higher education system in the state to respond to student demand and to prepare students for work.

Three measures of demand will be used in the assessment. "Employer demand" is a measure of the number of net annual job openings projected through 2012 by education level. "Student demand" is a projection of the number of students seeking enrollments in the higher education system. Finally, "community demand" will be assessed through an examination of data not reflected in the aforementioned projections. This will include community development plans, emerging industries, or other factors that may impact the higher education needs of a community.

What follows is a more detailed discussion of the measures and the data sources and methods used in their development.

Workforce Supply

The assessment of workforce supply will rely on IPEDS data on degree production; however, we cannot assume that all graduates are entering the workforce. Some care must be taken to assess how many graduates are entering the workforce and what proportion of students will not enter the workforce due to continued enrollment or other factors. Therefore, the total degrees awarded must be adjusted to account for graduates who do not choose to enter the workforce, either to continue their studies or for other reasons, before we can arrive at the number of graduates available to meet employer demand. The net effect of migration into and out of the state will be considered in the final analysis. In general, migration would be expected to fill the gap between supply and demand for educated workers. Because SBCTC has access to student-level enrollment and outcome data, they are able to more precisely track continuing enrollments of associate degree holders and other transfer students and do not count those students who continue to enroll as entering the workforce. Workforce supply for baccalaureate degree holders will be calculated as follows:

Workforce Supply = IPEDS Baccalaureate Degrees – less graduates who do not enter the workforce

IPEDS Degrees - C - (L*(1-LE))
IPEDS Degrees - 14.1% - (6.4% * (1-23.9%)).

IPEDS Degrees - 19.035%

Included Variables:

IPEDS Degrees: Degrees awarded in Washington in 2003 (IPEDS)

Benchmark Data from Baccalaureate and Beyond 1999-2000, Spring 2001 (one year after graduation)[29]

C = Currently Enrolled in Grad School Full-Time 14.1%
L = Not in Labor Force 6.4%
LE = 23.9% of L Enrolled Full-Time

The number of graduate degrees awarded will be adjusted to account for graduates who do not enter the labor force based on benchmark data provided through the NCES National Household Education Survey of 1995 Adult Education that indicates the number of degree holders age (24-39) who report they are "not in the labor force".

IPEDS Masters Degrees - L_m
IPEDS Professional Degrees - L_p
IPEDS Doctorate Degrees - L_d

L_m = Master Degree Holders not in Labor Force 13.6%
L_p = Professional Degree Holders not in Labor Force 6.2%
L_d = Doctorate Degree Holders not in Labor Force 9.9%

Education Supply

Education supply may be estimated a number of ways. The most readily available approach is to estimate current enrollment capacity within the system based on current enrollments (funded or actual) and the distribution of students by major, course taking patterns, or degrees earned. Estimates based on current enrollments may mask differences by field of study whereby some programs may be over-subscribed while others may be under-enrolled. Therefore, the public four-year campuses have been asked to provide additional information about impacted programs that will be discussed in the student demand section of the report.

Total enrollments will be based on enrollment data available from the Office of Financial Management for the public institutions and IPEDS enrollment data will be used for the private enrollments. In addition, planned capacity of the four-year public colleges will be used to estimate the maximum size of the existing institutions. The Independent Colleges of Washington (ICW) has provided information on planned growth of their member institutions as well (see

[29] (2003) A Descriptive Summary of 1999-2000 Bachelor's Degree Recipients 1 Year Later, National Center for Education Statistics 2003-165.

Appendix F for a listing of ICW schools). Capacity by major field of study will be examined based on current degree production and enrollments, but will not be projected forward. Instead, the needs assessment will identify the gaps with the expectation that institutions would provide resources where needed to meet student, employer, and community demand. Both enrollment and degree data will be aggregated based on the groupings used in the NCES Baccalaureate and Beyond Studies. In addition, specific fields of study may be pulled out and examined individually. The categories are provided in Appendix B.

Data

IPEDS enrollment data: Enrollments reported to IPEDS for fall 2003 (the most recent year with complete data).

ICW member enrollments: The independent colleges of Washington have provided data from member institutions on enrollments and growth plans through 2012.

HECB data on capacity: The HECB maintains data on the student capacity at public intuitions in the state. For purposes of the needs assessment, the lesser of either physical capacity or capacity limit (due to zoning or other restrictions) will be used.

Education Supply = current enrollment (using OFM for public and IPEDS or ICW for privates).

Planned Capacity = (the lesser of physical capacity or capacity limit for publics and planned growth for ICW). Other privates will be excluded from this measure with the presumption that they would grow to meet a portion of demand not met by other sectors.

Employer Demand

Several approaches may be used to understand employer demand.

The first is to look at the aggregate demand by level of training as is currently done in the WTECB gap analysis (see Appendix E). The gap analysis estimates additional FTE needed in postsecondary training programs greater than one year but less than a bachelor's degree. This is done by matching the number of "prepared workers" at that education level to the number of anticipated annual openings projected for the period of the assessment. The gap is the number of additional workers multiplied by the average FTE/completion ratio of programs that fit the profile described above.

There are a number of critical decision points in this type of analysis which can impact the estimates of need. First, how we assign the level of training required for a given occupation is critical. BLS uses 11 standard training categories outlined in the BLS Occupational Outlook Handbook. These categories are assigned by BLS staff based on an assessment of the predominate level of training for new entrants into the occupation. This approach does not necessarily identify the minimum qualification for a given occupation, although it may serve as

an adequate proxy for most occupations. More importantly, the training categories do not differentiate training requirements within occupations nor do they allow for an analysis of continuing training needs within the occupation. In 2004, BLS proposed an alternate approach which is described in the Occupational Projections and Training Data, 2004-05 Edition http://www.bls.gov/emp/optd/home.htm. The new approach groups occupations into educational clusters that better reflect the diversity of training paths one might take to enter the occupation and the ultimate educational attainment of workers in that occupation. While neither of these approaches provides a perfect picture of the training needed for a given occupation, they do provide a starting point to develop a matching strategy that can provide useful summary information on minimum requirements and continuing education needs.

An important limitation with the long-term occupational projections is that they are based on historical employment data and are limited in the degree to which they can account for structural changes in industries or occupations. A further complicating factor is that the net openings due to growth and replacement relies on national BLS data to calculate attrition in occupations which may or may not accurately reflect the number of departures expected in Washington.

After considerable consultation with staff at the Workforce Training and Education Coordinating Board and the State Board for Community and Technical Colleges, the determination was made to include two estimates of employer demand. Employer demand will be estimated based on the training and education required to meet projected employment based on the Department of Employment Security's long-term employment outlook projections. The outlook projections will be matched with two estimates of training levels for occupational groups, a minimum training requirement based on BLS training codes, and an ultimate training level based on HECB analysis of census data – an approach similar to that used in the educational cluster approach described above.

Data

Data: May 2005 long-term occupational projection published by the Washington State Department of Employment Security.

2000 Census PUMS 5% File: Education levels and occupations of adults residing in Washington ages 25-64 who worked during the previous year.

Dependent Variables

Employer Demand - Average Annual Openings 2007 -2012. Statewide Total Net openings are adjusted based on total employment projection (May 2005 long-term employment projection – Washington State Department of Employment Security) to arrive at a total number of workers required by occupational area.

High Growth –High Wage Occupations. For each region, high growth/high wage occupations are identified as those occupations with wages and growth in the highest quartile (e.g., of occupations in highest wage quartile those occupations with the highest growth).

Independent Variables

SOC Code: The Standard Occupational Code is used to classify occupations and to match data sets used in the analysis. The SOC code also provides for aggregation of occupations with the first two digits of the code identifying a major grouping and the remaining four digits providing for increasingly specific occupational titles.

2007-2012 Net Job Openings: Department of Employment Security's May 2005 long-term occupational projections.

Entry Level Training Requirement: The Workforce Training and Education Coordinating Board uses collapsed (WTECB Training Code) categories to describe the training levels required for occupations. In addition, WTECB and SBCTC re-classify some occupations to better reflect training requirements in Washington.

BLS Training Category	WTECB Training Code	WTECB Training Category
First professional degree	1	Long Preparation
Doctoral degree	1	Long Preparation
Master's degree	1	Long Preparation
Bachelor's plus experience	1	Long Preparation
Bachelor's degree	1	Long Preparation
Associate degree	2	Mid-Level Preparation
Postsecondary vocational award	2	Mid-Level Preparation
Work experience in a related occupation	2	Mid-Level Preparation
Long-term on-the-job training	2	Mid-Level Preparation
Moderate-term on-the-job training	3	Short Preparation
Short-term on-the-job training	4	Little Preparation

Ultimate Training Level: Data collected in the 2000 Census are used to measure the actual training level for workers by occupation. The distribution of training levels in occupations is used to estimate the training needs to meet the projected openings for an occupation. The approach builds on the assumption that the BLS code is a proxy for the entry level training requirement for an occupation and that additional training beyond the minimum level may be required for some portion of the workers within that occupation. With these assumptions, the

"Ultimate Training Level" is calculated based on the distribution of workers in the population at or above the entry level training requirement as follows:

Entry Level Training Requirement (WTECB Training Code) is set as minimum for a given occupation.

For Level 4 occupations:
Level 4 projection = projected openings - portion of openings (based on census) at level 3
Level 3 projection = projected openings - level 4 projection

For Level 3 occupations:
Level 3 projection = projected openings - portion of openings (based on census) at level 2
Level 2 projection = projected openings - level 3 projection

For Level 2 occupations:
Level 2 projection = projected openings - portion of openings (based on census) at level 1
Level 1 projection = projected openings - level 2 projection (distributed across BA - Doc proportionally based on census proportions)

For Level 1 occupations:
BA Projection = projected openings - portion of openings (based on census) at graduate level
Grad Projection = projected openings - BA projection (distributed across MA-Doc proportionally based on census proportions)

Student Demand

Typically, student demand has been projected based on historic participation rates plus enhancements based on historic trends and/or policy goals (such as increasing participation of under-represented minorities, rural students, etc.). This approach is a good starting point; however, it has some important limitations in assessing actual demand when access to educational sectors and majors is limited by structural factors such as enrollment caps. To measure demand for enrollment at four-year colleges and universities, a better measure would be unduplicated (qualified) applicants rather than current enrollments. Similarly, to measure demand for a given program, it would be preferable to measure unduplicated qualified applications to majors rather than the number of students enrolled in a given major or in coursework offered by a given department. OFM conducts an application match study that provides an unduplicated count of applications, admissions, and enrollment to the public institutions within Washington. While this study provides an important starting point in understanding access to the sector students prefer, it does not get us closer on access to specific fields of study nor does it take into account out-of-state enrollments or discouraged students who fail to apply.

In the *2004 Strategic Master Plan for Higher Education*, the HECB took a new approach to project student enrollments. Rather than base projections on historic participation, the HECB approach is to project the number of degrees awarded based on historic trends then back into an estimate of enrollments based on historic FTE/degree ratios. The needs assessment will employ both approaches. Student demand will be projected based on historic participation rates to arrive at a "status quo" estimate of enrollment demand. The report will also include a forecast of degrees awarded based on historic rates. Finally, the report will include a discussion of impacted majors where projections may underestimate actual demand due to limited participation resulting from enrollment caps or other structural impediments to student enrollment.

Data

HECB projection of enrollments based on current (2003-2004) participation rates using HECB's Enrollment Simulation Model (version 1.15).

Degree Projections = HECB analysis of bachelor degrees earned per 20-29 year olds
HECB analysis of graduate and professional degrees earned per 25-34 year olds

Historic Enrollment / Degree Ratio = the number of FTEs required to produce one degree

Current Demand = projection of student demand based on current participation rates

Degree Demand = the total number of projected degrees (for bachelor's degrees, the number of 20-29 year olds based on population forecast * Degrees per 20-29 year olds; for graduate and professional degrees, the number of 25-34 year olds based on population forecast * Degrees per 25-34 year olds)

Student Demand = Enrollment projection based on FTE required to produce the projected number of degrees (degree demand)

Statewide Average Participation: the regional reports will compare the current regional participation rate with the statewide average rate by age

Public / Private Attendance Ratio = ratio of enrollments in public and private institutions as reported to IPEDS for the 2003 academic year

Community Demand

Community demand will include factors that are not readily picked up in the projections discussed above. We have identified a number of sources for information about community plans and goals for future development. These elements will be largely qualitative in nature. Community demand will include factors such as the seven areas of growth identified by CTED for statewide development. These include value-added agriculture, wood products, technology,

aerospace, tourism, bio-technology, and marine services. In addition, we have gathered information from the regional development councils and other community groups on regional development goals.

The regional analysis will also consider any additional information about specific trends in the area that may affect higher education needs. These include key industry developments, emerging technologies, or other factors.

Finally, we have partnered with the University of Washington on a series of surveys and interviews sponsored by the Sloan Foundation that will gather information from business leaders, students, and the community members at large. The questionnaires center on aspirations of these constituents for future economic development and how higher education can support those goals.

Data

Workforce Development Plans: Statewide development goals provided by CTED and regional development plans based on consultation with workforce development councils and other community groups.[30]

State and Regional Economic profiles: The Department of Employment Security develops regional profiles that include summary information on industries, education, and occupations by region of the state.

UW / Sloan research project: Data from the UW employer interviews and community needs survey will be incorporated in the analysis of community demand.

[30] 2005 Miller, J. Sommers, P. Assessing Community Demand: Insights from Washington's Regional Workforce Development Councils. Seattle University Center on Metropolitan Development.

Appendix B: Academic and Occupational Categories

Table B-1 Crosswalk of Major Academic Fields of Study and CIP Titles

Humanities	05	Area, Ethnic, Cultural, and Gender Studies
	16	Foreign languages, literatures, and Linguistics
	23	English Language and Literature/Letters
	24	Liberal Arts and Sciences, General Studies and Humanities
	30	Multi/Interdisciplinary Studies
	38	Philosophy and Religious Studies
	39	Theology and Religious Vocations
	50	Visual and Performing Arts
	54	History
Social/behavioral sciences	42	Psychology
	44	Public Administration and Social Service Professions
	45	Social Sciences
Life sciences	03	Natural Resources and Conservation
	26	Biological and Biomedical Sciences
Physical sciences	40	Physical Sciences
	41	Science Technologies/Technicians
Math	27	Mathematics and Statistics
Computer/information science	11	Computer and Information Sciences and Support Services
Engineering	14	Engineering
	15	Engineering Technologies/Technicians
Education	13	Education
	25	Library Science
Business/management	52	Business, Management, Marketing, and Related Support Services
Health	31	Parks, Recreation, Leisure, and Fitness Studies
	51	Health Professions and Related Clinical Sciences
Vocational/technical	43	Security and Protective Services
	46	Construction Trades
	47	Mechanic and Repair Technologies/Technicians
	48	Precision Production
	49	Transportation and Materials Moving
Other Professional or Technical	01	Agriculture, Agriculture Operations, and Related Sciences
	02	Agricultural Sciences
	04	Architecture and Related Services
	08	Area, Ethnic, Cultural, and Gender Studies
	09	Communication, Journalism, and Related Programs
	10	Communications Technologies/Technicians and Support Services
	12	Personal and Culinary Services
	19	Family and Consumer Sciences/Human Sciences
	20	Family and Consumer Sciences/Human Sciences
	22	Legal Professions and Studies
	29	Military Technologies

Table B-2 Occupational Categories and SOC Titles

Occupational Category	SOC	SOC Title
Business and Management	11	Management Occupations
	13	Business and Financial Operations Occupations
Computer Science	15	Computer and Mathematical Occupations
Engineering/software engineering/ architecture	17	Architecture and Engineering Occupations
Research, scientists, technical	19	Life, Physical, and Social Science Occupations
Human/protective service professionals	21	Community and Social Services Occupations
	33	Protective Service Occupations
Administrative/clerical/legal	23	Legal Occupations
	43	Office and Administrative Support Occupations
Educators	25	Education, Training, and Library Occupations
Editors/writers/performers	27	Arts, Design, Entertainment, Sports, and Media Occupations
Medical professionals	29	Health Care Practitioners and Technical Occupations
	31	Health Care Support Occupations
Sales and Service Occupations	35	Food Preparation and Serving Related Occupations
	37	Building and Grounds Cleaning and Maintenance Occupations
	39	Personal Care and Service Occupations
	41	Sales and Related Occupations
Agriculture and Trades	45	Farming, Fishing, and Forestry Occupations
	47	Construction and Extraction Occupations
	49	Installation, Maintenance, and Repair Occupations
	51	Production Occupations
	53	Transportation and Material Moving Occupations

Appendix C: Region Definitions

Regional analysis is based on Workforce Development Areas (WDA) with an additional area of special analysis which includes the Snohomish WDA and part of the Northwest Washington WDA to include Snohomish, Island, and Skagit Counties (SIS).

WDA Number	WDA Name	Counties in WDA
I	Olympic Consortium	Clallam, Jefferson, and Kitsap
II	Pacific Mountain Consortium	Grays Harbor, Lewis, Mason, Pacific, and Thurston
III	Northwest Washington	Island, San Juan, Skagit, and Whatcom
IV	Snohomish County	Snohomish
V	Seattle-King County	King
VI	Pierce County	Pierce
VII	Southwest Washington	Clark, Cowlitz, Skamania, and Wahkiakum
VIII	North Central Washington	Adams, Chelan, Douglas, Grant, and Okanogan
IX	Tri-County	Kittitas, Klickitat, and Yakima
X	Eastern Washington	Asotin, Columbia, Ferry, Garfield, Lincoln, Pend Oreille, Stevens, Walla Walla, and Whitman
XI	Benton Franklin	Benton and Franklin
XII	Spokane County	Spokane

Appendix D: Statewide Programs

Courses exclusive to University of Washington (RCW 28B.20.060):

- law
- medicine
- forest products
- logging engineering
- library sciences
- aeronautic and astronautic engineering
- fisheries

Courses exclusive to Washington State University (RCW 28B.30.060/RCW 28B.30.065):

- agriculture in all its branches and subdivisions
- veterinary medicine
- economic science in its application to agriculture and rural life

Major lines common to University of Washington and Washington State University (RCW 28B.10.115):

- pharmacy
- architecture
- civil engineering
- mechanical engineering
- chemical engineering
- forest management (as distinguished from forest products and logging engineering which are exclusive to the University of Washington)

Teachers' training courses (RCW 28B.10.140):

The University of Washington, Washington State University, Central Washington University, Eastern Washington University, Western Washington University, and The Evergreen State College are each authorized to train teachers and other personnel for whom teaching certificates or special credentials prescribed by the State Board of Education are required, for any grade, level, department, or position of the public schools of the state.

Appendix E: Related Reports and Data Sources

Report/ Data Source	Agency	Description
Enrollment Simulation Model	HECB	The HECB enrollment simulation model is a tool that can be used to estimate enrollment demand and budgets based on a variety of factors, including historic or desired participation rates, degree goals, and other factors. The model allows for regional differences as well as differences by age, gender, race, or a host of other variables.
Strategic Master Plan	HECB	The HECB includes enrollment goals for the two year and four year sectors in the 2004 strategic master plan. These goals are based on an estimate of historic participation, student and employer demand, and analysis of net migration of educated workers to the state.
Baccalaureate Capacity Study	HECB	The HECB is developing a study of upper-division capacity within the state. The report is expected to be completed in fall 2005. A study on the same topic, conducted jointly by COP and SBCTC, was released in December 2004.
HECB Branch Campus Report	HECB	The HECB report on the branch campus self-studies provides analysis of statewide and regional participation rates in higher education and estimates of enrollment growth.
Higher Education Cost Study	HECB	The Education Cost Study, conducted by the HECB every four years provides important information about enrollments, class size, teaching loads, and cost of delivery for public colleges and universities in the state.
Employer Survey	WTECB	The Workforce Training and Education Coordinating Board conducts a bi-annual survey of employers in the state to determine the degree to which they are being served by the state higher education system (primarily the two-year system). The survey provides important information on the degree to which employers are able to recruit and retain workers with the appropriate level of training to fill openings within the organization. In addition, the survey collects data on employer need for training of current workers and any support employers provide for that purpose. WTECB is making changes in the survey to collect data on baccalaureate and graduate educational needs as well.

Gap Analysis	WTECB	Workforce Training and Education Coordinating Board produces an annual report to analyze the need for additional postsecondary degrees and training programs greater than one year but less than a bachelor's degree. This analysis relies on Department of Employment Security projections and Bureau of Labor Statistics training codes to arrive at the number of trained workers needed to fill projected openings and from the WTECB staff estimates of the number of FTE students needed in worker training programs.
Workforce Training Results	WTECB	The WTECB and SBCTC collaborate to produce an annual report that assesses employment outcomes of students who exit the two year system. The report is used to estimate the return to schooling in terms of increased wages. http://www.wtb.wa.gov/jtr
Baccalaureate Capacity Study	SBCTC	The State Board for Community and Technical Colleges released in December 2004 a study of the need for increased capacity at the upper-division undergraduate level to meet projected student demand.
Enrollment Data	OFM	OFM collects data from all the public colleges and universities on current enrollments and makes enrollment projections based on current participation rates and an alternative projection based on 1993 participation rates.
Application Match Study	OFM	OFM conducts an annual study of applications to postsecondary institutions in the state to determine the degree to which students are being served by the system. The study looks at unduplicated applications and enrollments to determine whether students who applied to colleges and universities were offered admission to at least one institution in the state. Students who were qualified (based on AI) but were not offered enrollment within Washington are considered not be served by the system.
Education Highlights Report	OFM	Includes historic and projected data on enrollments, participation rates, and costs.
Industry and Occupational Projections	Employment Security Department	Every two years, the Department of Employment Security produces a set of statewide and regional short-term and long-term projections of industry growth which in turn are used to estimate the need for workers by occupation. Current long-term projections estimate net job openings by occupation through 2012.

Educator Supply and Demand in Washington 2004 Report	Superintendent of Public Instruction	Provides detailed estimates of the supply and demand for teachers at different levels and in different disciplines in Washington state.
Integrated Postsecondary Education Data System (IPEDS)	NCES	All Title IV eligible institutions report enrollments and degrees completed by CIP code to NCES annually. These data are collected by the HECB as part of the IPEDS reporting process.
Measuring Up 2004	National Center for Public Policy and Higher Education	
Net Migration	National Center for Public Policy and Higher Education	
Other Reports:		
	NCES	Variety of reports based on current data though IPEDS as well as longitudinal studies such as "Baccalaureate and Beyond"
	Washington State Public Policy Institute	Various – including Branch Campus Report
	MGT of America	North Snohomish/Island/Skagit (NSIS) and other regional reports

Appendix F: Included Colleges and Universities

Public Four-Year

Central Washington University
Eastern Washington University
Evergreen State College
University of Washington-Bothell Campus
University of Washington-Seattle Campus
University of Washington-Tacoma Campus
Washington State University
Washington State University-Tri Cities
Washington State University-Vancouver
Western Washington University

Private (Independent Colleges of Washington)

Gonzaga University
Heritage University
Pacific Lutheran University
Saint Martins University
Seattle Pacific University
Seattle University
University of Puget Sound
Walla Walla College
Whitman College
Whitworth College

Private/Degree Authorized (Other)

Antioch University-Seattle Branch
Argosy University- Seattle Campus
Art Institute of Seattle
Bastyr University
City University
Cornish College of the Arts
Crown College
Devry University-Washington
Digipen Institute of Technology
Faith Evangelical Lutheran Seminary
Golden Gate Baptist Theological Seminary-Northwest
Henry Cogswell College
ITT Technical Institute
Mars Hill Graduate School
Northwest Baptist Seminary
Northwest College of Art
Northwest College of The Assemblies of God
Puget Sound Christian College
Seattle Institute of Oriental Medicine
Trinity Lutheran College
University of Phoenix-Spokane Campus and Washington Campus

Appendix G: Compendium of Tables

Table G.1 Degrees Awarded (IPEDS)

Category	2001-2002	2002-2003	2003-2004	3-Year Average	Total Change	Percent Change
Baccalaureate						
Humanities	5683	6802	6932	6,472	1249	22%
Social/behavioral sciences	4898	4618	4931	4,816	33	1%
Life sciences	1530	1528	1538	1,532	8	1%
Physical sciences	431	477	458	455	27	6%
Mathematics	258	289	299	282	41	16%
Computer/information science	676	804	877	786	201	30%
Engineering	1297	1304	1405	1,335	108	8%
Education	1462	1493	1946	1,634	484	33%
Business/management	4391	4579	4663	4,544	272	6%
Health	1438	1540	1608	1,529	170	12%
Vocational/technical	443	440	484	456	41	9%
Other technical/professional	1950	2068	2099	2,039	149	8%
Total Baccalaureate	**24457**	**25942**	**27240**	**25,880**	**2,783**	**11%**
Masters						
Humanities	432	607	555	531	123	28%
Social/behavioral sciences	1084	1173	1145	1,134	61	6%
Life sciences	240	263	247	250	7	3%
Physical sciences	150	133	103	129	-47	-31%
Mathematics	62	60	53	58	-9	-15%
Computer/information science	155	216	189	187	34	22%
Engineering	367	366	327	353	-40	-11%
Education	2360	2764	2793	2,639	433	18%
Business/management	1683	1695	1963	1,780	280	17%
Health	680	703	714	699	34	5%
Vocational/technical	17	16	10	14	-7	-41%
Other technical/professional	321	317	383	340	62	19%
Total Masters	**7551**	**8313**	**8482**	**8,115**	**931**	**12%**

Table G.1 Degrees Awarded (IPEDS)
(continued)

Category	2001-2002	2002-2003	2003-2004	3-Year Average	Total Change	Percent Change
Professional / Doctorate						
Humanities	94	157	169	140	75	80%
Social/behavioral sciences	105	98	106	103	1	1%
Life sciences	114	120	138	124	24	21%
Physical sciences	55	69	76	67	21	38%
Mathematics	18	15	13	15	-5	-28%
Computer/information science	12	18	14	15	2	17%
Engineering	104	89	108	100	4	4%
Education	56	80	64	67	8	14%
Business/management	16	20	23	20	7	44%
Health	661	646	509	605	-152	-23%
Vocational/technical	-	-	-	-	n/a	n/a
Other technical/professional	622	585	687	631	65	10%
Total Professional / Doctorate	**1857**	**1897**	**1907**	**1,887**	**50**	3%

Table G.2 Degrees and Workforce Supply

2004 Degrees Awarded and Baccalaureate Supply				
Major Area of Study	**Bachelor's Degrees**	**Baccalaureate Supply**	**Graduate and Professional Degrees**	**Graduate and Professional Supply**
Humanities	6,932	5,616.97	724	633
Social/behavioral sciences	4,931	3,995.57	1,251	1,085
Life sciences	1,538	1,246.24	385	338
Physical sciences	458	371.12	179	157
Math	299	242.28	66	58
Computer/information science	877	710.63	203	176
Engineering	1,405	1,138.47	435	380
Education	1,946	1,576.84	2,857	2,471
Business/management	4,663	3,778.41	1,986	1,717
Health	1,608	1,302.96	1,223	1,093
Vocational/technical	484	392.18	10	9
Other technical/professional	2,099	1,700.81	1,070	975
Total	**27,240**	**22,072.46**	**10,389**	**9,090**

Table G-3 Degrees Awarded to Nonresident Aliens

	2003-04 BACHELORS		2003-04 Grad/Pro		2003-04 MASTERS		2003-04 DOCTORATE		2003-04 PROF.	
	TOTAL	**NONRES**	**TOTAL**	**NONRES**	**TOTAL**	**NONRES**	**TOTAL**	**NONRES**	**TOTAL**	**NONRES**
PUBLIC FOUR-YEAR TOTAL										
2001-02	18635	583	5540	681	4285	504	613	167	642	10
2002-03	19661	552	5896	724	4628	570	619	148	649	6
2003-04	20456	538	6003	759	4685	572	670	179	648	8
Average Percentage of Degrees Awarded to Nonresident Aliens (public colleges)		2.8%		12.4%		12.1%		26.0%		1.2%
PRIVATE FOUR-YEAR TOTAL										
2001-02	5827	276	3868	198	3266	188	41	2	561	8
2002-03	6281	246	4314	280	3685	259	44	1	585	20
2003-04	6784	220	4386	139	3797	128	59	6	530	5
Average Percentage of Degrees Awarded to Nonresident Aliens (private colleges)		3.9%		4.9%		5.3%		6.3%		2.0%
Average Percentage of Degrees Awarded to Nonresident Aliens (all colleges)		**3.1%**		**9.3%**		**9.1%**		**24.6%**		**1.6%**

Table G.4 Budget and Projected Enrollments (based on 2003-2004 participation)

Year	Budget	All	Community and Technical Colleges	Four-Year Institutions
2003-04	213,338	228,179	137,621	90,558
2004-05	216,469	231,361	139,362	91,999
2005-06	220,162	234,290	140,917	93,373
2006-07	224,394	237,252	142,723	94,528
2007-08	224,394	241,040	144,855	96,184
2008-09	224,394	244,962	147,108	97,854
2009-10	224,394	249,220	149,543	99,677

Table G.5 Budget and Projected Enrollments (2003-2004 participation and HECB degree forecast)

Year	Budgeted FTEs	Projected Public FTEs (current participation)	Projected Public FTEs (demand for degrees)
2004	213,338	228,179	228,313
2005	216,469	231,361	221,489
2006	220,162	234,290	244,779
2007	224,394	237,252	251,811
2008	224,394	241,040	258,921
2009	224,394	244,962	266,094
2010	224,394	249,220	272,875

Table G.6 Projected Enrollments by Sector (HECB degree forecast)

Year	Two-Year Public FTEs	Two-Year Private FTEs	Undergraduate FTEs Public Four-Year	Undergraduate FTEs Private Four-Year	Graduate FTEs Public Four-Year	Graduate FTEs Private Four-Year	Total
2004	138,241	8,001	72,841	24,164	17,232	13,464	273,942
2005	128,885	8,119	75,122	24,920	17,482	13,660	268,188
2006	149,092	8,232	77,833	25,820	17,854	13,950	292,781
2007	153,126	8,372	80,295	26,636	18,390	14,369	301,189
2008	156,960	8,520	82,839	27,480	19,121	14,941	309,862
2009	161,045	8,670	85,163	28,251	19,886	15,538	318,553
2010	165,130	8,824	87,170	28,917	20,575	16,076	326,692

Table G.7 Training Requirements to Meet Projected Annual Openings 2007-2012

Summary Training Requirements to Meet Annual Openings 2007-2012				
DRAFT 6-22-2005 using May 05 Employment Projections and 2000 Census 5% Data for Washington				
	Entry Level Training Requirement		Ultimate Training Level	
Little Training	48,517	39%	43,356	35%
Short-Term Training	20,838	17%	19,580	16%
Mid Level Training (Includes AA)	30,391	25%	29,729	24%
Long Training (BA+)	23,161	19%	30,242	25%
Bachelor's Degree	17,593	14%	20,947	14%
Masters Degree	2,376	2%	6,295	5%
Professional Degree	1,580	1%	1,878	2%
Doctorate Degree	1,612	1%	1,122	1%

Table G.8 Annual Demand for Workers with a BA or Higher by Occupation 2007-2012

Demand for Workers with BA or Higher		
Occupation	**Entry Demand**	**Ultimate Demand**
Educators	5,411	5,762
Business and Management	5,270	6,311
Engineering, Software Engineering, Architecture	1,791	1,908
Computer Science	3,251	3,558
Medical Professionals	1,485	3,322
Editors, Writers, Performers	1,323	1,702
Human, Protective Service Professionals	1,704	2,299
Research, Scientists, Technical	1,513	1,715
Administrative, Clerical, Legal	643	1,095
Mechanics, Laborers	82	851
Service Industries	688	1,719
Total	23,161	30,242

Table G.9 Demand for Workers with a BA or Higher by SOC category 2007-2012

Demand for Workers with BA or Higher		
SOC Major Group	**Entry Demand**	**Ultimate Demand**
Management Occupations	2,880	3,161
Business and Financial Operations Occupations	2,390	3,150
Computer and Mathematical Occupations	3,251	3,558
Architecture and Engineering Occupations	1,791	1,908
Life, Physical, and Social Science Occupations	1,513	1,715
Community and Social Services Occupations	1,704	1,704
Legal Occupations	643	699
Education, Training, and Library Occupations	5,411	5,762
Arts, Design, Entertainment, Sports, and Media Occupations	1,323	1,702
Healthcare Practitioners and Technical Occupations	1,485	3,056
Healthcare Support Occupations	-	266
Protective Service Occupations	-	595
Food Preparation and Serving Related Occupations	-	125
Building and Grounds Cleaning and Maintenance Occupations	-	31
Personal Care and Service Occupations	294	589
Sales and Related Occupations	394	975
Office and Administrative Support Occupations	-	396
Farming, Fishing, and Forestry Occupations	-	24
Construction and Extraction Occupations	-	256
Installation, Maintenance, and Repair Occupations	-	212
Production Occupations	-	140
Transportation and Material Moving Occupations	82	220
Total	23,161	30,242

Table G.10 Demand for Workers by Occupation and Education Level

	Entry Training Level				Ultimate Training Level			
	BA	**MA**	**Pro**	**Doc**	**BA**	**MA**	**Pro**	**Doc**
Educators	3,917	280	-	1,214	3,273	1,995	81	414
Business and Management	5,270	-	-	-	5,095	1,022	89	105
Engineering, Software Engineering, Architecture	1,791	-	-	-	1,496	337	35	39
Computer Science	3,144	84	-	23	2,795	625	26	112
Medical Professionals	349	233	903	-	1,845	485	891	100
Editors, Writers, Performers	1,323	-	-	-	1,402	237	33	31
Human, Protective Service Professionals	531	1,035	138	-	1,445	754	67	33
Research, Scientists, Technical	394	744	-	375	943	475	60	237
Administrative, Clerical, Legal	104	-	539	-	481	78	509	27
Mechanics, Laborers	82	-	-	-	699	103	35	15
Service Industries	688	-	-	-	1,474	184	52	10

Table G.11 Occupation and Education Matrix. Workforce supply based on BA or higher degrees awarded in 2004 (percentages in rows)

Major Course of Study	Educators	Business and management	Engineering / software engineering / architecture	Computer science	Medical professionals	Editors / writers / performers	Human / protective service professionals	Research, scientists, technical	Administrative / clerical / legal	Mechanics, laborers	Service industries	Other, uncodeable
Humanities	24%	19%	1%	6%	2%	13%	5%	2%	10%	4%	14%	1%
Social/behavioral sciences	18%	25%	1%	3%	3%	2%	17%	4%	10%	3%	13%	2%
Life sciences	16%	15%	1%	3%	10%	1%	3%	26%	5%	9%	9%	3%
Physical sciences	17%	11%	2%	6%	6%	1%	3%	44%	2%	2%	4%	4%
Math	43%	23%	4%	8%	0%	0%	2%	7%	3%	2%	6%	2%
Computer/information science	1%	14%	15%	58%	1%	0%	0%	3%	4%	2%	3%	1%
Engineering	3%	11%	51%	11%	1%	1%	0%	13%	2%	4%	3%	1%
Education	75%	6%	1%	2%	1%	0%	3%	0%	3%	2%	7%	0%
Business/management	4%	54%	1%	9%	1%	1%	1%	2%	7%	4%	16%	1%
Health	8%	11%	1%	1%	57%	1%	5%	3%	3%	2%	9%	1%
Vocational/technical	9%	25%	2%	2%	3%	0%	33%	4%	9%	4%	7%	1%
Other technical/professional	8%	22%	5%	4%	6%	10%	4%	5%	9%	7%	19%	1%
Total	21%	23%	4%	6%	7%	4%	6%	5%	7%	4%	12%	1%

Table G.12 Occupation and Education Matrix. Workforce supply based on BA or higher degrees awarded in 2004 (percentages in rows)

Major Course of Study	Educators	Business and management	Engineering / software	engineering / architecture	Computer science	Medical professionals	Editors / writers / performers	Human / protective service professionals	Research, Scientists; technical	Administrative / clerical / legal	Mechanics, laborers	Service industries	Other, uncodeable
Humanities	22%	16%	4%	18%	6%	64%	16%	8%	29%	22%	23%	18%	
Social/behavioral sciences	14%	18%	2%	8%	8%	6%	49%	14%	24%	13%	17%	21%	
Life sciences	4%	3%	1%	2%	7%	1%	3%	27%	4%	12%	4%	11%	
Physical sciences	1%	1%	1%	2%	1%	0%	1%	15%	0%	1%	1%	6%	
Math	2%	1%	1%	1%	0%	0%	0%	1%	0%	1%	0%	2%	
Computer/information science	0%	2%	10%	26%	0%	0%	0%	2%	2%	1%	1%	2%	
Engineering	1%	2%	61%	8%	1%	1%	0%	13%	1%	5%	1%	4%	
Education	46%	3%	3%	3%	2%	1%	6%	1%	7%	6%	8%	3%	
Business/management	3%	41%	5%	24%	2%	4%	4%	5%	17%	19%	24%	17%	
Health	3%	4%	1%	1%	64%	1%	7%	4%	3%	4%	6%	5%	
Vocational/technical	1%	1%	1%	0%	1%	0%	8%	1%	2%	1%	1%	1%	
Other technical/professional	3%	8%	11%	6%	8%	21%	6%	8%	11%	16%	14%	9%	
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

Table G-13 Public Higher Education Participation by Age and Region

Participation by Age Group

All Public Colleges and Universities (CTC + Public Four-Year)

	Age Group					
Region	**17-19**	**20-24**	**25-29**	**30-34**	**35-49**	**50+**
Washington State Total	**14.3%**	**19.0%**	**6.6%**	**3.9%**	**2.2%**	**0.6%**
Olympic	13.2%	17.5%	5.7%	3.9%	1.9%	0.5%
Pacific Mountain	13.7%	21.0%	7.2%	4.4%	2.2%	0.5%
Northwest	12.3%	15.7%	7.1%	3.8%	2.0%	0.5%
Snohomish	15.0%	19.9%	5.4%	3.0%	1.9%	0.7%
Seattle-King	17.5%	20.4%	6.9%	3.8%	2.2%	0.6%
Pierce	12.5%	17.4%	6.2%	4.1%	2.6%	0.7%
Southwest	12.2%	17.3%	5.5%	3.1%	1.8%	0.5%
North Central	12.5%	20.1%	5.9%	3.5%	1.9%	0.3%
Tri-County	11.0%	14.7%	5.5%	3.7%	2.1%	0.4%
Eastern	12.7%	13.9%	7.1%	4.7%	2.4%	0.5%
Benton-Franklin	13.7%	22.6%	6.9%	4.1%	2.1%	0.5%
Spokane	15.5%	22.6%	9.5%	5.8%	2.8%	0.7%
SIS*	14.5%	19.3%	5.5%	3.1%	2.0%	0.6%

*SIS includes data from Snohomish and Northwest regions.

Table G-14 Higher Education Growth Estimates by Region

Higher Education Participation by Region Growth Estimate to meet student demand in 2010 All Public Colleges and Universities			
	Total 2003 Enrollment FTE	**Percent Increase to Meet Population Growth in 2010**	**Percent Increase to Meet State Average in 2010**
State Total	**207,051**	**11%**	**19%**
Olympic	8,888	12%	23%
Pacific Mountain	13,709	13%	16%
Northwest	11,032	14%	31%
Snohomish	31,658	16%	20%
Seattle-King	61,401	8%	9%
Pierce	23,512	9%	17%
Southwest	12,546	18%	35%
North Central	6,766	13%	26%
Tri-County	7,532	5%	32%
Eastern	6,081	7%	32%
Benton-Franklin	6,620	11%	15%
Spokane	17,306	8%	n/a
SIS*	24,408	15%	21%

*SIS includes data from Snohomish and Northwest regions.

RESOLUTION NO. 05-19

WHEREAS, RCW 28B.76.230 directs the Higher Education Coordinating Board to develop a comprehensive and ongoing process to analyze the need for additional degrees and programs, additional off-campus centers and locations for degree programs, and consolidation or elimination of programs by the (public) four-year institutions; and

WHEREAS, The *2004 Strategic Master Plan for Higher Education* calls for a statewide and regional needs assessment that would provide a planning tool that, in conjunction with analysis of institutional roles and missions, will guide academic program and facility planning and approval; and

WHEREAS, The *State and Regional Needs Assessment* will allow for data-driven decisions related to the allocation of student enrollments by providing a comprehensive assessment of regional higher education needs to meet student, employer, and community demand; and

WHEREAS, The needs assessment was developed in collaboration with the public and private four-year colleges, the Workforce Training and Education Coordinating Board, the State Board for Community and Technical Colleges, the Office of Financial Management, the Employment Security Department, and the Department of Community, Trade and Economic Development; and

WHEREAS, The needs assessment will be updated every two years; and

WHEREAS, The needs assessment shows Washington's higher education should be expanded to better serve students, employers, and communities;

THEREFORE, BE IT RESOLVED, That the Higher Education Coordinating Board adopts the methodology, findings, and recommendations of the *State and Regional Needs Assessment*.

Adopted:

October 27, 2005

Attest:

_____
Roberta Greene, Vice Chair

_____
Jesus Hernandez, Secretary